

In This Issue

This issue of the Journal of Developmental Origins of Health and Disease includes two Brief Reports, one demonstrating regional differences in birth size within Finland and one examining the impact of flaxseed oil on brain development in rats. The issue contains 11 original articles including seven human studies and four animal studies. Human studies include epidemiologic work focused on nutritional effects as well as novel studies of tooth emergence patterns, vitamin D exposure and asthma, and placental mTOR pathways. Animal studies include effects of dietary alterations on metabolic measures, lipid profiles and carotid artery remodeling, as well as effects of post-natal progesterone on cerebellar myelination. We have included a corrigendum indicating corrections to the brief report of Sandboge *et al.* We elected to include the corrigendum rather than corrected manuscript as the paper had been published online prior to being included in this issue of the journal.

Brief Reports

Regional differences in birth size: a comparison between the Helsinki Birth Cohort Study and contemporaneous births on the Åland Islands. Sandboge *et al.* examined birth characteristics of individuals born on the Åland Islands as compared to the Helsinki Birth Cohort from 1937–1944. Mean birth weight in the Åland Cohort was 87 grams higher than Helsinki Cohort. These findings raised important questions as to the causative factors and long term outcome differences associated with regional differences in birth weight.

Brain development in male rats subjected to early weaning and treated with diet containing flour or flaxseed oil after 21 days until 60 days. Pessanha and colleagues examined whether flaxseed oil treatment impacts body and brain mass in male rats subjected to early weaning. Early weaning alone resulted in lower body and absolute brain mass, though higher relative brain mass, with evidence of lower body mass persisting to 60 days of age. Flaxseed flour supplementation to early weaned animals normalized body mass and relative brain mass at 60 days. These results suggest that flaxseed flour, containing essential fatty acids, may contribute to brain development after early weaning.

Original Articles

Maternal nutrition in pregnancy and metabolic risks among neonates in a Pakistani population, a pilot study. Shaikh and co-authors examined the association between maternal undernutrition and metabolic risk factors in newborns utilizing cord blood samples. Glucose, cholesterol triglycerides and LDL cholesterol were significantly higher in

offspring born to undernourished mothers. These findings suggest that offspring of undernourished mothers have a higher metabolic risk profile at birth.

Maternal and newborn infants amino acid concentrations in obese women born themselves with normal and small for gestational age birth weight. Tsyvian *et al.* compared serum amino acid concentrations in maternal and infants in normal pregnant and in obese women who were either born SGA or normal birth weight. Most amino acid concentrations and the fetal to maternal amino acid gradients were significantly lower in the infants of obese women who themselves were born SGA. These results suggest changes in placental amino acid transport or synthetic function in this subgroup of women.

Longitudinal changes in maternal and neonatal anthropometrics: a case study of the Helsinki Birth Cohort, 1934–1944. Moltchanova and Ericksson examined maternal and neonatal anthropometrics from periods of 1934–44 within Finland. Although there were no significant changes in either neonatal or adult anthropometrics of babies born in Helsinki during this period of time, there were marked changes in the characteristics of the mothers including maternal age, maternal BMI, and gestational age.

Growth retardation at early life and metabolic adaptation among North Korean children. Lee *et al.* examined energy metabolism and nutritional status among normal height and growth restricted North Korean children living in South Korea. Children who were growth restricted or stunted had a significantly higher respiratory quotient, suggesting that under-nutrition in early in life results in adaptations in metabolism that favor fat deposition.

Maternal and early life factors of tooth emergence patterns and number of teeth at 1 and 2 years of age. Ntani and co-authors examined the effect of environmental factors on dentition. In a study of 2915 children, the authors demonstrated that maternal smoking during pregnancy, social economic status and physical activity may influence the child's primary dentition.

Vitamin D exposure during pregnancy, but not early childhood, is associated with risk of childhood wheezing. Anderson and colleagues performed a cohort study of children recruited through the TARGeT Kids primary-care research network. Vitamin D supplementation during pregnancy was associated with lower odds of childhood wheezing, but child vitamin D supplementation and childhood (25(OH) D) levels were not associated with reduced wheezing. These results suggest

an important role of the pregnancy period on the programming of the pulmonary function.

The placental mTOR-pathway: correlation with early growth trajectories following intrauterine growth restriction?. Fahlbusch and co-authors examined the expression of placental mTOR, a nutrient/energy sensor, within placentas of IUGR and control offspring. IUGR offspring demonstrated significant catch-up growth by one year of age, correlating with the level of activated mTOR.

Improvement in metabolic effects by dietary intervention is dependent on the precise nature of the developmental programming challenge. Bautista *et al* utilized a maternal protein restricted diet to assess if post weaning dietary modifications alter offspring outcomes. Post weaning diets containing vegetable protein reduced carcass fat levels and improved fasting glucose and triglycerides compared with controls suggesting that adult dietary intervention may partially overcome adverse effects of programming.

Standard short-term diet ameliorates the lipid profile altered by a fructose-rich diet in rats. Cambri and colleagues examined the effects of a fructose rich diet during neonatal period in rats. The authors reported that the fructose diet reduced weight gain and altered the lipid profile, which was partially reversed by an standard adult diet. These findings have

important implications due to the excessive intake of fructose as a sweetener in western diets.

Long-term effects of maternal undernutrition on offspring carotid artery remodeling: role of miR-29c. Khorram and co-authors examined the effects of maternal undernutrition on programming of the extracellular matrix components of vessel walls. Expression of miR-29c was significantly decreased in offspring carotid arteries of undernourished dams, which was partially blocked by treatment with metyrapone. These results suggest a correlation between miR-29c and extracellular matrix proteins which may contribute to programmed hypertension.

Effect of postnatal progesterone therapy following preterm birth on neurosteroid concentrations and cerebellar myelination in guinea pigs. Palliser *et al* utilized preterm guinea pig neonates to examine the effect of postnatal progesterone treatment. Progesterone increased brain allopregnanolone concentrations and decreased myelin basic protein in male but not females. These findings indicate progesterone effects on neurosteroid concentrations which may alter central development.

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Journal of Developmental Origins of Health and Disease (J DOHaD)